

Tundra watches yield of new product soar with help from MuAnalysis analytical services



Background

Tundra Semiconductor Corp., a fabless semiconductor company, designs, develops, and markets chips that manage information transfer for Internet and wireless communications, data storage, military applications, and industrial automation. Tundra specializes in System Interconnect products, which efficiently interface standard components within a computer or communications system. With many of the largest communications companies in the world as customers, Tundra has a proven record of excellence in quality design and delivery of its products. Cellular phone providers, Internet providers, and North American defense communications all have Tundra technology embedded in their systems.

Communications equipment makers often rely on standard interfaces when designing their products, since it reduces development risk and allows integration of third-party software or hardware. PCI is a long-established and popular standard for connecting peripherals to a personal computer. Already a strong player in the PCI bus system interconnect market, Tundra began designing a next-generation PCI Bus Switch product, the PowerSpan II, in 2002.

Dramatically falling yields

Initial yields of the first silicon version of the PowerSpan II hovered around 50%. Tundra engineers made a small design change to improve timing. Their efforts were rewarded when the next version of the chip worked perfectly – only the yields dropped to 6%. Tundra engineers identified a circuit that was causing 94% of chips to be rejected. They ran several simulations to localize the failure, then turned to MuAnalysis analytical services for help.

ABOUT THE CUSTOMER

Tundra Semiconductor designs System Interconnect products for Internet, wireless, storage, defense, and industrial automation applications

ISSUE

Yield of new product dropped inexplicably

SOLUTION

MuAnalysis device analysts worked in tandem with Tundra engineers to rapidly uncover data that suggested a manufacturing process problem

RESULTS

Next manufacturing run, yield jumped to over 90%

QUOTABLE

“The yield improvement facilitated by MuAnalysis enables Tundra to meet our customers’ expectations for volume and delivery of the PowerSpan II,” says Wendy Burgess, Director, Demand Creation, Tundra. **“This was not possible with our former yields.”**

MuAnalysis

Rapid failure analysis

Tundra was now shipping the eagerly awaited PowerSpan II to customers, but yield was well below target. Tundra engineers, in partnership with MuAnalysis analytical experts, formulated a plan of attack. MuAnalysis, using expert sample preparation, focused ion beam (FIB) and microprobing techniques, was able to show Tundra complete waveforms from the failing device in less than 48 hours. MuAnalysis then performed emission microscopy, and found suspect light emissions within the failing device. This pointed to a potential manufacturing process problem.

Failure resolution

With the information and insight supplied by MuAnalysis, Tundra created a comprehensive report for the foundry partner. The depth of detail allowed the fab to identify an issue with their process that could be causing difficulty. On the next run of PowerSpan II chips, the foundry partner addressed this issue. The result — yield on the Tundra PowerSpan II jumped to over 90%.

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Benefits of working with MuAnalysis

- Professional, expert results
- Fast failure analysis and problem resolution
- Reduced support costs

MuAnalysis offers:

- Electronics and photonics services
- Life Sciences services
- Manufacturing support services
- Materials analysis services

About MuAnalysis

MuAnalysis is a leading supplier of microanalytical services to electronics and photonics companies. MuAnalysis services enable semiconductor innovators to save time and money by reducing design cycle time, improving yields, and maximizing product quality. MuAnalysis facilities comprise state-of-the-art laboratories devoted to electron microscopy, emission microscopy, focused ion beam (FIB) microsurgery, failure analysis techniques, and reliability testing. For more information, please visit the company web site at www.muanalysis.com. MuAnalysis is an affiliate of Semiconductor Insights.

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